Claims

1. An expression cassette, comprising

a polynucleotide sequence encoding a polypeptide including an HIV *Pol* polypeptide, wherein the polynucleotide sequence encoding said *Pol* polypeptide comprises a sequence having at least 90% sequence identity to the sequence presented of Figure 8 (SEQ ID NO:30); Figure 9 (SEQ ID NO:31) or Figure 10 (SEQ ID NO:32).

2. The expression cassette of claim 1, further comprising one or more nucleic acids encoding one or more viral polypeptides or antigens.

3. The expression cassette of claim 2, wherein the viral polypeptide or antigen is selected from the group consisting of Gag, Env, vif, vpr, tat, rev, vpu, nef and combinations thereof.

4. The expression cassette of claim 1, further comprising one or more nucleic acids encoding one or more viral cytokines.

5. A recombinant expression system for use in a selected host cell, comprising, an expression cassette of claim 1, and wherein said polynucleotide sequence is operably linked to control elements compatible with expression in the selected host cell.

6. The recombinant expression system of claim 5, wherein said control elements are selected from the group consisting of a transcription promoter, a transcription enhancer element, a transcription termination signal, polyadenylation sequences, sequences for optimization of initiation of translation, and translation termination sequences.

7. The recombinant expression system of claim 5, wherein said transcription promoter is selected from the group consisting of CMV, CMV+intron A, SV40, RSV, HIV-Ltr, MMLV-ltr, and metallothionein.

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8. A cell comprising an expression cassette of claim 1, and wherein said polynucleotide sequence is operably linked to control elements compatible with expression in the selected cell.

9. The cell of claim 8, wherein the cell is a mammalian cell.

10. The cell of claim 9, wherein the cell is selected from the group consisting of BHK, VERO, HT1080, 293, RD, COS-7, and CHO cells.

11. The cell of claim 10, wherein said cell is a CHO cell.

12. The cell of claim 8, wherein the cell is an insect cell.

13. The cell of claim 12, wherein the cell is either *Trichoplusia ni* (Tn5) or Sf9 insect cells.

14. The cell of claim 8, wherein the cell is a bacterial cell.

15. The cell of claim 8, wherein the cell is a yeast cell.

16. The cell of claim 8, wherein the cell is a plant cell.

17. The cell of claim 8, wherein the cell is an antigen presenting cell.

18. The cell of claim 17, wherein the antigen presenting cell is a lymphoid cell selected from the group consisting of macrophage, monocytes, dendritic cells, B-cells, T-cells, stem cells, and progenitor cells thereof.

19. The cell of claim 8, wherein the cell is a primary cell.

20. The cell of claim 8, wherein the cell is an immortalized cell.

21. The cell of claim 8, wherein the cell is a tumor-derived cell.

SUB A3

22. A composition for generating an immunological response, comprising an expression cassette of claim 1.

23. The composition of claim 22, further comprising one or more *Pol* polypeptides.

24. The composition of claim 23, further comprising an adjuvant.

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25. A composition for generating an immunological response, comprising an expression cassette of claim 2.

26. The composition of claim 25, further comprising a *Pol* polypeptide.

27. The composition of claim 26, further comprising one or more polypeptides encoded by the nucleic acid molecules of claim 2.

28. The composition of claim 27, further comprising an adjuvant.

SUB A5

29. A method of immunization of a subject, comprising,

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introducing a composition of claim 22 into said subject under conditions that are compatible with expression of said expression cassette in said subject.

30. The method of claim 29, wherein said expression cassette is introduced using a gene delivery vector.

31. The method of claim 30, wherein the gene delivery vector is a non-viral vector.

32. The method of claim 30, wherein said gene delivery vector is a viral vector.

33. The method of claim 32, wherein said gene delivery vector is a Sindbis-virus derived vector.

34. The method of claim 32, wherein said gene delivery vector is a retroviral vector.

35. The method of claim 32, wherein said gene delivery vector is a lentiviral vector.

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36. The method of claim 30, wherein said composition delivered using a particulate carrier.

37. The method of claim 30, wherein said composition is coated on a gold or tungsten particle and said coated particle is delivered to said subject using a gene gun.

38. The method of claim 30, wherein said composition is encapsulated in a liposome preparation.

39. The method of any of claims 30-38, wherein said subject is a mammal.

40. The method of claim 39, wherein said mammal is a human.

41. A method of generating an immune response in a subject, comprising:
providing an expression cassette of claim 1,
expressing said polypeptide in a suitable host cell,
isolating said polypeptide, and
administering said polypeptide to the subject in an amount sufficient to elicit an immune response.

42. A method of generating an immune response in a subject, comprising
introducing into cells of said subject an expression cassette of claim 1, under conditions that permit the expression of said polynucleotide and production of said polypeptide, thereby eliciting an immunological response to said polypeptide.

43. The method of claim 42, where the method further comprises administration of an HIV-derived polypeptide.

44. The method of claim 43, wherein administration of the polypeptide to the subject is carried out before introducing said expression cassette.

45. The method of claim 43, wherein administration of the polypeptide to the subject is carried out concurrently with introducing said expression cassette.

46. The method of claim 43, wherein administration of the polypeptide to the subject is carried out after introducing said expression cassette.

47. The expression cassette of claim 2, wherein the viral polypeptide or antigen is selected from the group consisting of polypeptides derived from hepatitis B, hepatitis C and combinations thereof.

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